

### **REMARKS**

Claims 1-15 and 17-24 are pending. Claims 3-8 and 18-19 stand allowed. Claims 1-2, 9-12, 14-17 and 20-23 stand rejected. Claim 24 is pending. Although claim 24 may have been examined, the Office Action has not indicated the allowability of claim 24 and has not objected to or rejected claim 24. Because of this silence, the Office Action is incomplete. Claim 13 stands objected to as being dependent on a rejected base claim.

By this Amendment previously dependent claims 17 and 22 have been written in independent form. Merely rewriting previously dependent claims 17 and 22 into independent form does not raise any new issues requiring further search and/or consideration at least because claims 17 and 22 have been previously considered in their dependent form. Accordingly, these claim amendments are proper for entry. Contingent upon entry of these claim amendments, claim 16 is cancelled.

Since the Office Action has not rejected claim 24, claim 24 is to be regarded as defining patentable subject matter. Since claim 24 is dependent directly on rejected base claim 1, claim 24 will be regarded herein as being objected to, but otherwise allowable if rewritten into independent form. For at least the reasons discussed below, claim 1, and therefore, claim 24 is in condition for allowance. Claim 24 is treated as claim 13 is treated below.

#### **A. Claim 16 Is No Longer Pending**

The Office Action rejects claim 16 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 4,245,220 to Johnson. Claim 16 is no longer pending.

#### **B. Each of Claims 1-2, 9, 14-15 and 21 Is Unobvious Over Johnson in view Kitayama et al.**

The Office Action rejects claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,245,220 to Johnson in view of U.S. Patent No. 5,107,522 to Kitayama, et al. (hereinafter Kitayama). This rejection is respectfully traversed. The Office

Action fails to establish a *prima facie* case for the obviousness of claims 1-2, 9, 14-15 and 21 for at least the following reasons.

1. Johnson Is Non-Analogous Art

Johnson is non-analogous art to the claimed invention. M.P.E.P. §2141.01(a) instructs that, to be analogous, a reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

In an exemplary case in the electrical arts, the Federal Circuit held that a reference does not become analogous art to the patent claims, merely because the reference, like the claimed invention, dealt with single inline memory modules (SIMMs). See *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993). Something more is required. In the *Wang* case, the patent claims dealt with SIMMs for installation on a printed circuit motherboard for use in a personal computer. In the *Wang* case, the reference dealt with SIMMS used in an industrial controller. The reference was found to be in a different field of endeavor because it involved memory circuits in which modules of varying sizes may be added or replaced, whereas the claimed invention in the patent involved compact modular memories. The *Wang* Court held that the finding that the reference was non-analogous art was supported by substantial evidence because the SIMM of the claims at issue was intended for personal computers and used dynamic random-access-memories, whereas the reference SIMM was developed for use in large industrial machine controllers and only taught the use of static random-access-memories or read-only-memories. The use of SIMMs in personal computers is a different field of endeavor than the use of SIMMs in industrial controllers.

In the present application, the Johnson reference is in a different field of endeavor than the field of endeavor of the claimed invention. Johnson seeks to provide an active sonar system (i.e., one with a transmitter and receiver) that does not use phase or time delay networks to form

the beams and does not require a multi-element array (column 1, lines 5-12). Even if, *arguendo*, Johnson's sonar system were modified to be that of a radio navigation system according to the teachings of Johnson, as asserted in the Office Action, the field of Johnson's endeavor would still be that of an active system that determines bearing angle to a reflective target. The active system of Johnson includes a transmitter providing a specific predetermined waveform bounced off the reflective target and a receiver to receive echoed replicas of the specific predetermined waveform. Johnson actually requires the particular waveform specified in Johnson's patent for his device to work at all. In contrast, the field of endeavor of the claimed invention is that of a passive receiver (without a transmitter) that determines the range to a non-cooperating emitter. The passive receiver listens to a non-cooperating emitter to receive any signal that is transmitted and must cope with any waveform that the non-cooperating emitter chooses to transmit. These are different fields of endeavor.

Furthermore, Johnson is not reasonably pertinent to the particular problem with which the inventor of the present application was concerned. "A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." See *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). Johnson's active sonar system would not have reasonably commended itself to the inventor's attention.

The particular problem with which the inventor was concerned is the measurement of a range to a non-cooperating emitter using only a passive receiver with no active transmitter. The passive receiver measures range in spite of any arbitrary waveform that may be provided by the non-cooperating emitter. Johnson would not have commended itself to the inventor's attention at least because:

- (i) The particular problem with which Johnson is involved is the determination of a bearing angle using an active system, but the claimed invention is involved with determining range;
- (ii) Johnson's device is an active system that requires both an echo signal receiver and a signal transmitter for transmitting pulses (column 1, lines 14-17), but the claimed invention is purely a passive listening system; and

- (iii) Johnson's signal transmitter is required to transmit at a frequency that increases progressively during each pulse period from a frequency  $f$  to a frequency  $f+\Delta f$  in order for the sonar system to work (column 1, lines 65-68), but claimed invention must listen to any arbitrary waveform that the non-cooperative emitter transmits.

In the section on Response to Argument on page 12, lines 3-6, the Office Action asserts that "Johnson's system can be applied to radar navigation system" and cites column 4, lines 34-37. This assertion misses the central questions to be answer regarding the non-analogous nature of Johnson. The questions are (1) whether Johnson is in the field of the applicant's endeavor and (2) whether Johnson is reasonably pertinent to the particular problem with which the inventor was concerned.

First, as to whether Johnson is in the field of the applicant's endeavor, Johnson is not. The field of Johnson's endeavor is that of active systems used to determine an angle to a target by echo reflections. The statement that "the system could be applied to corresponding Radar Navigation and/or target location systems" (Johnson column 4, lines 34-36) does not transform Johnson's field of endeavor into the field of endeavor of the presently claimed invention. Even if, *arguendo*, Johnson could be read as being in the radar navigation field of endeavor, Johnson specifically states that the "invention seeks to provide inter alia, a sonar system which does not use phase or time delay networks to form the beam" (Johnson column 1, lines 9-11). In contrast, the claimed invention measures range, not angle, by determining phase difference over time (i.e., the frequency difference).

Second, as to whether Johnson is reasonably pertinent to the particular problem with which the inventor was concerned, Johnson is not. In the present application, the inventor was concerned with the problem of measuring range to a non-cooperating emitter. In contrast, Johnson is pertinent to the determination of a bearing angle using an active system that transmits at a frequency that increases progressively during each pulse period and then receives the echoed replicas.

Since Johnson is non-analogous art to the claimed invention, it cannot be art applied to a rejection under section 103(a). *In re Oetiker*, 977 F.2d at 1446. Accordingly, withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson

in view of Kitayama is earnestly solicited at least because the Office Action has failed to apply analogous art.

## 2 Kitayama Is Non-Analogous Art

Even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention, Kitayama is non-analogous art to the claimed invention. The standards of what is analogous and non-analogous art are discussed above with respect to the instructions of M.P.E.P. §2141.01(a). The central questions to be answer regarding the non-analogous nature of Kitayama are (1) whether Kitayama is in the field of the applicant's endeavor and (2) whether Kitayama is reasonably pertinent to the particular problem with which the inventor was concerned.

First, as to whether Kitayama is in the field of the applicant's endeavor, Kitayama is not. The field of Kitayama's endeavor is that of a frequency converter with an automatic frequency control (AFC) for processing a digital modulation signal through a mixer, the output from which is to be stabilized in frequency. In particular, Kitayama's frequency converter includes an automatic frequency control circuit 34 (AFC circuit 34) in which the frequency of a frequency-converted digital modulation signal (to be supplied as an input to a demodulation circuit) is stabilized (see column 1, lines 8-21). In contrast, the field of endeavor of the claimed invention is the measurement of range to a non-cooperating emitter using a passive receiver. Kitayama is not in the same field of endeavor as the claimed invention.

Second, as to whether Kitayama is reasonably pertinent to the particular problem with which the inventor was concerned, Kitayama is not. In the present application, the inventor was concerned with the problem of measuring range to a non-cooperating emitter with a passive receiver. In contrast, Kitayama was involved with overcoming the problem of phase and amplitude variations in band pass filter 201, e.g., variations occasioned by temperature changes (column 2, line 62 through column 3, line 7). Since the digital modulation signal passes through filter 201, the digital modulation signal is influenced by the phase and amplitude variations of filter 201 and the frequency of the frequency-divided digital modulation signal becomes higher or lower than the frequency that should be provided to the phase comparator 303 under error free

conditions. For example, the temperature induce phase and amplitude variations of filter 201 are falsely propagated into error signals 304, 305 (see column 1, line 62 through column 2, line 7; FIG. 1). Kitayama is not reasonably pertinent to the particular problem solved by the claimed invention.

Since Kitayama is non-analogous art to the claimed invention, is cannot be art applied to a rejection under section 103(a). *In re Oetiker*, 977 F.2d at 1446. Accordingly, withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to apply analogous art.

3. Each Of Claims 1-2, 9, 14-15 And 21 Is Unobvious Over Johnson In View Of Kitayama

Even if, *arguendo*, Johnson were to be regarded as analogous art to the claimed invention and even if, *arguendo*, Kitayama were to be regarded as analogous art to the claimed invention, the Office Action still fails to establish a *prima facie* case of the obviousness of claims 1-2, 9, 14-15 and 21 for at least the following reasons.

The Office Action fails to establish a *prima facie* case that independent claims 1, 9 and 21, and all claims dependent thereon, would have been obvious to a person of ordinary skill in the art at the time of the invention. The United States Supreme Court established the basic rules for analyzing an invention's obviousness and articulated three factual inquiries to be made in an obviousness determination. *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). This analysis requires a factual inquiry into (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed subject matter, and (3) the level of skill of a person of ordinary skill in the art at the time the invention was made. The M.P.E.P. instructs that "examiners should apply the test for patentability under 35 U.S.C. §103 set forth in *Graham*." See M.P.E.P. 2141 through 2143.

M.P.E.P. 2143.01 instructs that "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art." "[T]he central question is

whether there is reason to combine references,” *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). “[A] showing of a suggestion, teaching, or motivation to combine the prior art references is an ‘essential component of an obviousness holding’,” *Brown and Williamson Tobacco Corp. v. Phillip Morris Inc.*, 229 F.3d 1120, 1124-1125, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).” See M.P.E.P., section 2143.01, page 2100-98, Rev. 1, Feb. 2000, 7th Ed (emphasis in the original).

The determination of obviousness under 35 U.S.C. §103(a) is a legal conclusion that must be based on factual evidence. *Burlington Indus., Inc. v. Quigg*, 822 F.2d 1581, 1584, 3 USPQ2d 1436, 1439 (Fed. Cir. 1987). The results of the factual inquiries articulated in *Graham v. John Deere Co.* provide the factual evidence upon which the legal conclusion of obviousness is to be based.

Establishment of a suggestion or incentive to modify or combine prior art references requires substantial evidence of such suggestion or incentive. “The factual question of motivation is material to patentability, and could not be resolved on subjective belief of unknown authority,” *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002). Office Action assertions of such suggestion or motivation, without a prior art reference as evidentiary support, is merely subjective belief and is insufficient to constitute substantial evidence upon which a legal conclusion can be based. *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002).

In the present application, the Office Action’s asserted motivation to modify Johnson is “such that the frequency error could be simply directly control[led] by microprocessor, with low cost.” In particular, the Office Action asserts, with respect to each of independent claims 1, 9 and 21, that “it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Johnson with Kitayama’s microprocessor controlled oscillator signal for frequency conversion [circuit] 1, such that the frequency error could be simply directly control[led] by microprocessor, with low cost.” What Kitayama actually discloses is that a

“principal object of the present invention is therefore to provide an AFC circuit having a simple structure and implementable in lower cost” (emphasis added) (column 2, lines 29-32).

First, as to lower cost as a motivation, motivation can be found only where the evidence shows a teaching or suggestion of the desirability of the specific modification or combination. To provide a circuit at lower cost is not motivation to make the specific modification proposed by the Office Action. “[T]here must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant” (emphasis added), *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). “[P]articular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention would have selected these components for combination in the manner claimed,” *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). If the Office Action’s “lower cost” as motivation reasoning were to prevail, as general as it is, then such reasoning would give license to propose ANY modification to a primary reference when this kind of non-specific motivation can be culled from a secondary reference. However, the law as discussed above in *In re Dance*, requires that the motivation be a motivation to make the specific modification proposed. A claim of lower cost does not provide motivation for the suggested specific modification.

Second, as to simple direct control over the frequency error as motivation, Kitayama does not specifically disclose this motivation. However, controlling frequency errors in the IF signal is an ordinary function of the AFC circuit disclosed in Kitayama, but Johnson in view of Kitayama does not disclose, teach or suggest (1) a motivation to modify Johnson to add an AFC circuit, or (2) a motivation to modify Johnson to control frequency errors in the local oscillator frequency as suggested in the Office Action. The Office Action asserts that it is the output of Kitayama’s VCO 309 that is applied in place of Johnson’s local oscillator signal fb, not the IF signal. Therefore, even if, *arguendo*, simple direct control over the frequency error were to be regarded as sufficient motivation to modify Johnson, the motivation would suggest a different modification than that proposed by the Office Action. The motivation would not suggest that the local oscillator signal fb fed to Johnson’s mixer 4 should be derived from the output of Kitayama’s VCO 309 as asserted in the Office Action.



It is respectfully submitted that the Office Action fails to support a legal conclusion of obviousness with factual evidence. In particular, the Office Action fails to provide evidence of motivation to combine the applied references in the in the way proposed in the Office Action. The U.S. Patent and Trademark Office bears the initial burden of establishing that the claimed invention is *prima facie* obvious. *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). M.P.E.P. 4142 instructs that the “examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.”

Accordingly, the Office Action fails to set forth a *prima facie* case of obviousness in support of its rejections, and withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited.

4. Each Of Claims 1-2 Is Unobvious Over Johnson In View Of Kitayama

The Office Action, on page 3, admits that “Johnson fails to teach the processor and an rf bridged coupled to the processor to receive reference signal from the processor.” But, the Office Action then goes on to assert that “Kitayama teaches these features, Fig. 11, the microprocessor 307 coupled to frequency conversion [circuit] 1, via reference oscillator 324, via VCO 309 having the reference oscillator 324 controlled by microprocessor 307, col. 20, lines 44-68, abstract, col. 3, lines 30-68, col. 4, lines 46-51.”

However, the Office Action is unclear as to what part of the Kitayama structure is to be regarded as the claimed processor. Three possibilities suggest themselves, but the Office Action does not specifically say which one is to be regarded as the claimed processor.

a. A First Possible Interpretation Of The Office Action

First, the Office Action might be asserting that microprocessor 307 of Kitayama’s FIG. 11 reads on the processor specified in claim 1 of the present application. In such a case, the output of microprocessor 307 of Kitayama’s FIG. 11 is either digital data (labeled DATA in FIG. 11), or if D/A converter 308 is regarded as part of the processor, the output might be regarded as an analog voltage (labeled VOLTAGE in FIG. 11). See Kitayama column 11, lines 4-7. If microprocessor 307, with or without D/A converter 308, of FIG. 11 reads on the claimed

processor, then the Office Action's proposed modification to Johnson would have to be to connect either digital data (labeled DATA in FIG. 11) or an analog voltage (labeled VOLTAGE in FIG. 11) from Kitayama's FIG. 11 in place of local oscillator signal fb in Johnson.

If, *arguendo*, the Office Action's proposed modification to Johnson is to connect either digital data (labeled DATA in FIG. 11) or an analog voltage (labeled VOLTAGE in FIG. 11) from Kitayama in place of local oscillator signal fb in Johnson, microprocessor 307 (or 307 and 308) would provide only a control signal to determine the oscillation frequency of reference oscillator 324 (column 11, lines 16-22). Such a control signal does not constitute a local oscillator signal fb fed to Johnson's mixer 4 (see Johnson, column 2, lines 43-45).

Accordingly, under this possible interpretation of the Office Action, the withdrawal of the rejection of claim 1, and all claims dependent on claim 1, is respectfully requested.

b. A Second Possible Interpretation Of The Office Action

Second, the Office Action might be asserting that microprocessor 307, and/or A/D converter 308 are to be coupled through phase locked loop (PLL) 320 of Kitayama's FIG. 11 such that a microprocessor controlled signal oscillator from VCO 309 provides a local oscillator signal fb fed to Johnson's mixer 4 (see Johnson, column 2, lines 43-45). However, in this case the PLL 320 is not part of the claimed processor specified in claim 1 of the present application, but the signal is coupled through PLL 320. This might be the structure that the Office Action envisions since the Office Action asserts that "it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Johnson with Kitayama's microprocessor controlled oscillator signal for frequency conversion [circuit] 1, such that the frequency error could be simply directly control[led] by microprocessor, with low cost" (emphasis added).

If, *arguendo*, the Office Action's proposed modification to Johnson is to connect the output of microprocessor 307 (or 308) through PLL 320, and in particular through VCO 309, of Kitayama to be used in place of a local oscillator signal fb fed to Johnson's mixer 4 such that the output of VCO 309 constitutes the reference signal received by the RF bridge as specified in claim 1, Johnson in view of Kitayama still would not establish a *prima facie case* for the obviousness of claim 1 for at least the following reasons.

The suggested combination connecting the output of Kitayama's microprocessor 307 (or 308) through PLL 320 of Kitayama so that the output of VCO 309 is used in place of a local oscillator signal fb fed to Johnson's mixer 4 would render Johnson (the primary reference) unsatisfactory for its intended purpose. M.P.E.P., section 2143.01, page 2100-99, Rev. 1, Feb. 2000, 7th Ed. instructs that "If proposed modification would render the prior art invention being modified [i.e., Johnson] unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

In particular, Kitayama FIG. 11 discloses an automatic frequency control (AFC) circuit 34 that stabilizes the frequency of the IF signal output from frequency conversion circuit 1 (Kitayama, FIG. 11, column 13, lines 4-14). The Office Action's proposed modification to Johnson would connect the output of VCO 309 of Kitayama in place of a local oscillator signal fb fed to Johnson's mixer 4. The resulting combination would stabilize the output from Johnson's mixer 4 in the same way that Kitayama's embodiments stabilize the output from frequency conversion circuit 1. This modification renders Johnson unsatisfactory for its intended purpose.

The principal of Johnson's operation would cease to work if the output of mixer 4 were to be stabilized in frequency. In this principal of operation, a transmit pulse having a frequency that sweeps from a frequency  $f$  to a frequency  $f+\Delta f$  over the pulse period is reflected off of a target and received at transducer 2. Since transducer 2 provides the input signal to mixer 4, the input to mixer 4 is swept from a frequency  $f$  to a frequency  $f+\Delta f$  over the pulse period. Since Kitayama's circuit in FIG. 11 will stabilize the frequency output from Johnson's mixer 4, the local oscillator input fb to mixer 4 must also sweep over a frequency range of  $\Delta f$  over the pulse period to stabilize the frequency output of mixer 4. Thus, the operation of the proposed combination results in the frequency of fb sweeping over a range of  $\Delta f$  over the pulse period.

Similarly, the frequency of the second harmonic  $2fb$  fed into Johnson's mixer 10 (see Johnson, column 2, lines 43-45) would have to sweep over a range of  $2\Delta f$  over the pulse period. Since the echoed replica of the transmit pulse already sweeps over a transmit range of  $\Delta f$  as

received at transducer 1 and fed into mixer 10, the output of mixer 10 would sweep over a frequency range of  $\Delta f$ .

Then, since the output of mixer 4 if frequency stabilized and the output of mixer 10 sweeps over a range of  $\Delta f$ , the mixed signal output of Johnson's mixer 3 would have a frequency that sweeps over a range of  $\Delta f$  over the pulse period, and the frequency difference detected between transducers 1 and 2 would be modulated onto the swept mixed signal output of mixer 3.

The proposed modification renders Johnson unsatisfactory for its intended purpose at least because the frequency output from Johnson's mixer 3 sweeps over a range of  $\Delta f$  over the pulse period. Johnson relies on the frequency difference detected between transducers 1 and 2 to be modulated on a signal of frequency  $f_b$  that does not sweep as the indication of the bearing angle to the target (see Johnson column 2, lines 45-48). In fact, the principal of Johnson's operation is that the output of mixer 3 is fed to a filter bank comprising filters arranged adjacently to cover a bandwidth (see Johnson column 2, lines 24-34). When  $f_b$  does not sweep, the bearing angle of the target causes the energy to be concentrated at the frequency of a single filter in the filter bank so it can be detected. Because the proposed modification would cause the output from Johnson's mixer 3 to sweep over a range of  $\Delta f$  over the pulse period, the proposed modification would cause energy from echoed replicas of the transmit pulse to appear in successively different individual filters. The energy would first appear in one filter and then sweep across the entire filter bank as the output from Johnson's mixer 3 sweeps over a range of  $\Delta f$  over the pulse period. Because of this sweeping of the frequency  $f_b$ , the modified Johnson would be incapable of localizing the detected echoed energy to a single filter, and the bearing angle to the target could not be determined. Thus, the proposed modification renders Johnson unsatisfactory for its intended purpose. Under such circumstances, there can be no motivation for combining Johnson and Kitayama. "If proposed modification would render the prior art invention being modified [i.e., Johnson] unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." See M.P.E.P., section 2143.01, page 2100-99, Rev. 1, Feb. 2000, 7th Ed.

Accordingly, withdrawal of the rejection of claims 1 and 2 is earnestly solicited.

c. A Third Possible Interpretation Of The Office Action

Third, the Office Action might actually be asserting that collectively microprocessor 307, A/D converter 308 and phase locked loop (PLL) 320 of Kitayama's FIG. 11 read on the processor specified in claim 1 of the present application. In this case, the PLL 320 would be regarded as part of the processor specified in claim 1 of the present application. The Office Action's assertions on page 5, with respect to claim 9, asserting that "reference oscillator 324 provides clock source" of which the claimed processor is comprised, suggests that the Office Action may be regarding the claimed processor as including Kitayama's microprocessor 307, D/A converter 308 and all of the parts of PLL 320.

If, *arguendo*, the Office Action's proposed modification to Johnson is to connect the output of VCO 309 of Kitayama to be used in place of a local oscillator signal fb fed to Johnson's mixer 4 (see Johnson, column 2, lines 43-45), Johnson in view of Kitayama still would not establish a *prima facie* case for the obviousness of claim 1, and all claims dependent on claim 1, for at least the following reasons.

For the same reasons discussed above, the suggested modification of Johnson in view of Kitayama, where microprocessor 307, A/D converter 308 and phase locked loop (PLL) 320 of Kitayama's FIG. 11 are regarded as the claimed processor specified in claim 1, and where the output of Kitayama's VCO 309 is used in place of a local oscillator signal fb fed to Johnson's mixer 4, would render Johnson (the primary reference) unsatisfactory for its intended purpose. M.P.E.P., section 2143.01, page 2100-99, Rev. 1, Feb. 2000, 7th Ed. instructs that "If proposed modification would render the prior art invention being modified [i.e., Johnson] unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

As discussed above, the proposed modification would cause the output from Johnson's mixer 3 to sweep in frequency over a range of  $\Delta f$  over the pulse period, and the proposed modification would cause energy from echoed replicas of the transmit pulse to appear in successively different individual filters. The energy would first appear in one filter and then sweep across the entire filter bank as the output from Johnson's mixer 3 sweeps over a range of

$\Delta f$  over the pulse period. Because of this sweeping of the frequency  $f_b$ , the modified Johnson would be incapable of localizing the detected echoed energy to a single filter, and the bearing angle to the target could not be determined. Thus, the proposed modification renders Johnson unsuitable for its intended purpose. Under such circumstances, there can be no motivation for combining Johnson and Kitayama. "If proposed modification would render the prior art invention being modified [i.e., Johnson] unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." See M.P.E.P., section 2143.01, page 2100-99, Rev. 1, Feb. 2000, 7th Ed.

Accordingly, withdrawal of the rejection of claim 1, and all claims dependent on claim 1, is earnestly solicited.

5. Each Of Claims 9 and 14-15 Is Unobvious Over Johnson In View Of Kitayama

The Office Action, on page 4, admits that "Johnson fails to teach a digital frequency source to generate a reference signal based on a signal from clock source, the reference signal being coupled to the rf bridge." But, the Office Action then goes on to assert that "Kitayama teaches these features [Fig. 11, the microprocessor 307 coupled to frequency conversion, via reference oscillator 324, via VCO 309 having the reference oscillator 324 controlled by microprocessor 307, col. 20, lines 44-68, abstract, col. 3, lines 30-68, col. 4, lines 46-51; reference oscillator 324 provides clock source from frequency divider 412 [Fig. 14, col. 14, lines 58-64]" (emphasis in the Office Action). It is respectfully submitted that, in the above quoted section of the Office Action, the Patent Office intended to cite column 12, lines 58-64 instead of column 14 since column 12 refers to FIG. 14 and column 14 does not.

The Office Action fails to establish a *prima facie* case for the obviousness of claim 9, and all claims dependent thereon, at least because the proposed combination does not meet all of the limitations specified in claim 9.

The Office Action reads Kitayama's reference oscillator 324, including divider 412 depicted in FIG. 14, as the clock source specified in claim 9, and reads the output of reference oscillator 324 as the "signal from a clock source" specified in claim 9. The Office Action is

reading the remaining part of the phase locked loop (PLL) 320 as “a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge” as specified in claim 9, and reading the output of VCO 309 as the claimed reference signal since it is the only signal coupled to Kitayama’s frequency conversion circuit 1.

First, PLL 320 is not digital and cannot be regarded as the digital frequency source specified in claim 9.

Second, even if, *arguendo*, PLL 320 was to be regarded as the digital frequency source specified in claim 9, PLL 320 is not part of microprocessor 307, and for at least this reason, Johnson in view of Kitayama does not disclose, teach or suggest a “processor including a digital frequency source” as specified in claim 9.

Third, even if, *arguendo*, microprocessor 307 was to be combined with PLL 320 and the combination was to be regarded as the processor specified in claim 9, Johnson in view of Kitayama still does not disclose, teach or suggest a receiver that includes a processor where the processor includes both:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9.

The Office Action, on page 4, asserts that “the processor coupled to the filter [sic.] bank 7, 8 in col. 2, lines 55-60 [sic.]” of Johnson reads on the claimed “processor coupled to the rf bridge to receive an information signal from rf bridge.” However, the Office Action ignores the claim limitation that the circuitry detects the frequency difference “based on the signal from the clock source.” This limitation is part of the claim as a whole and cannot be ignored.

The Office Action fails to establish a *prima facie* case for the obviousness of claim 9 at least because Johnson in view of Kitayama does not disclose, teach or suggest that both the claimed “digital frequency source” and the claimed “circuitry to detect” perform specified functions “based on the [same] signal from the [same] clock source” as specified in claim 9, and

therefore contained in all claims dependent on claim 9. Simply put, Johnson in view of Kitayama does not disclose, teach or suggest that “the signal from the clock source,” which the Office Action asserts to be the output of reference oscillator 324, is coupled to any circuitry used to detect a “frequency difference from the information signal” as specified in claim 9.

Fourth, even if, *arguendo*, microprocessor 307 was to be combined with PLL 320 and the combination was to be regarded as the processor specified in claim 9, Johnson in view of Kitayama still does not disclose, teach or suggest a receiver that includes a processor where the processor includes both:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source

as specified in claim 9, and therefore contained in all claims dependent on claim 9.

The Office Action fails to establish a *prima facie* case for the obviousness of claim 9 at least because Johnson in view of Kitayama does not disclose, teach or suggest one processor that includes both the claimed “digital frequency source” and the claimed “circuitry to detect” as specified in claim 9. In contrast, the signal processor described by Johnson at column 2, line 56 has no disclosed relation to the Office Action’s asserted processor assumed, in this instance, to include Kitayama’s microprocessor 307 and PLL 320.

Accordingly, withdrawal of the rejection of claim 9, and all claims dependent on claim 9, is respectfully requested.

6. Claim 21 Is Unobvious Over Johnson In View Of Kitayama

The Office Action, on page 6, admits that “Johnson fails to teach the ... processor providing a reference signal characterized by a reference frequency.” But, the Office Action then goes on to assert that “Kitayama teaches these features, Fig. 11, the microprocessor 307 [sic.] coupled to frequency conversion [circuit] 1, via reference oscillator 324, via VCO 309 having the reference oscillator 324 controlled by microprocessor 307, col. 20, lines 44-68, abstract, col. 3, lines 30-68, col. 4, lines 46-51.” However, the Office Action fails to establish a



*prima facie* case for the obviousness of claim 21 at least because Johnson in view of Kitayama does not disclose, teach or suggest all of the limitations specified in claim 21.

Even if, *arguendo*, either (1) microprocessor 307, and/or A/D converter 308 were to be coupled through phase locked loop (PLL) 320 of Kitayama's FIG. 11, or (2) collectively microprocessor 307, A/D converter 308 and phase locked loop (PLL) 320 of Kitayama's FIG. 11 were to be read as the processor specified in claim 21, Johnson in view of Kitayama does not disclose, teach or suggest "a processor providing a reference signal characterized by a frequency" and "an RF bridge ... providing an information signal to the processor ... characterized by a frequency equal to the reference frequency modulated by a frequency difference" as specified in claim 21. Simply put, any processor disclosed in Kitayama as providing a reference signal does not also receive an information signal from the RF bridge.

Furthermore, for at least the reasons discuss above with respect to the rejection of claim 1, Johnson in view of Kitayama (1) does not disclose, teach or suggest motivation to make the Office Action's proposed combination, and (2) even if the proposed combination were to be made, the resulting modification of Johnson would render Johnson unsatisfactory for its intended purpose. Under such circumstances, motivation cannot be found at least because the M.P.E.P., section 2143.01, page 2100-99, Rev. 1, Feb. 2000, 7th Ed. instructs that "If proposed modification would render the prior art invention being modified [i.e., Johnson] unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

Accordingly, withdrawal of the rejection of claim 21 is earnestly solicited.

**C. Each of Claims 10-11, 17, 20 and 22-23 Is Unobvious Over Johnson in view Kitayama et al. And Further In View Of DesJardins**

The Office Action rejects claims 10-11, 17, 20 and 22-23 under 35 U.S.C. §103(a) "as being unpatentable over Johnson '220 (sic.) in view of Kitayama, as applied to claim 9 above, and further in view of DesJardins (sic.) (US 5,570,099)." This rejection is respectfully traversed. The Office Action fails to establish a *prima facie* case for the obviousness of claims 10-11, 17, 20 and 22-23 for at least the following reasons.

1. Each of Claims 10-11, 17, 20 and 22-23 Is Patentable At Least Because Johnson And Kitayama Are Non-Analogous Art

First, as to claims 10-11, 17, 20 and 22-23 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Second, as to claims 10-11, 17, 20 and 22-23 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Kitayama is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

2. Claims 10 and 11 Are Unobvious Over Johnson In View Of Kitayama And DesJardins For At Least The Reasons Discussed With Respect To The Rejection Of Claim 9 Over Johnson In View Of Kitayama

In addition, as to claims 10 and 11 that are dependent on claim 9, the Office Action fails to establish a *prima facie* case for the obviousness of claims 10-11 for at least the reasons discussed above with respect to why claim 9 is unobvious over Johnson in view of Kitayama.

First, as discussed above with respect to the rejection of claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama does not disclose, teach or suggest a reason to modify the receiving arrangement of Johnson to include the AFC circuit of Kitayama as proposed by the Office Action with respect to the rejection of claim 9. Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest modifying the receiving arrangement of Johnson to include the AFC circuit of Kitazawa as proposed by the Office Action.

Second, as discussed above with respect to the rejection of claims 9 and 14-15, PLL 320 is not digital and cannot be regarded as the digital frequency source specified in claim 9.

Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest that PLL 320 is the digital frequency source specified in claim 9.

Third, as discussed above with respect to the rejection of claims 9 and 14-15, even if, *arguendo*, PLL 320 was to be regarded as the digital frequency source specified in claim 9, PLL 320 is not part of microprocessor 307, and for at least this reason, Johnson in view of Kitayama does not disclose, teach or suggest a “processor including a digital frequency source” as specified in claim 9. Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest that PLL 320 is part of microprocessor 307 and that Johnson in view of Kitayama disclose a “processor including a digital frequency source” as specified in claim 9.

Fourth, as discussed above with respect to the rejection of claims 9 and 14-15, even if, *arguendo*, microprocessor 307 was to be combined with PLL 320 and the combination was to be regarded as the processor specified in claim 9, Johnson in view of Kitayama still does not disclose, teach or suggest a receiver that includes a processor where the processor includes both:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9. Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest that the processor includes a digital frequency source to generate a signal and circuitry to detect a frequency difference where both the signal generated by the digital frequency source is based on the signal from the clock source and the circuitry to detect detects the frequency based on the signal from the clock source as specified in claim 9.

The Office Action, on page 4, asserts that “the processor coupled to the filter [sic.] bank 7, 8 in col. 2, lines 55-60 [sic.]” of Johnson reads on the claimed “processor coupled to the rf bridge to receive an information signal from rf bridge.” However, the Office Action ignores the

claim limitation that the circuitry detects the frequency difference “based on the signal from the clock source.” This limitation is part of the claim as a whole and cannot be ignored.

The Office Action fails to establish a *prima facie* case for the obviousness of claim 9 at least because Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest that both the claimed “digital frequency source” and the claimed “circuitry to detect” perform specified functions “based on the [same] signal from the [same] clock source” as specified in claim 9, and therefore contained in all claims dependent on claim 9. Simply put, Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest that “the signal from the clock source,” which the Office Action asserts to be the output of reference oscillator 324, is coupled to any circuitry used to detect a “frequency difference from the information signal” as specified in claim 9.

Fifth, as discussed above with respect to the rejection of claims 9 and 14-15, even if, *arguendo*, microprocessor 307 was to be combined with PLL 320 and the combination was to be regarded as the processor specified in claim 9, Johnson in view of Kitayama still does not disclose, teach or suggest a receiver that includes a processor where the processor includes both

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9. Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest that the processor includes both the digital frequency source and the circuitry to detect as specified in claim 9.

The Office Action fails to establish a *prima facie* case for the obviousness of claim 9 at least because Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest one processor that includes both the claimed “digital frequency source” and the claimed “circuitry to detect” as specified in claim 9. The signal processor described by Johnson at column 2, line 56 has no disclosed relation to the Office Action’s asserted processor assumed, in this instance, to include Kitayama’s microprocessor 307 and PLL 320.

Accordingly, withdrawal of the rejection of claims 10 and 11 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited.

3. Claims 10 And 11 Are Unobvious Over Johnson In View Of Kitayama And DesJardins For Additional Reasons

In addition to the above, the Office Action fails to establish a *prima facie* case of obviousness of claims 10 and 11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes “circuitry to detect” where the circuitry to detect includes:

a first Fourier transformer having a first center frequency; and

a second Fourier transformer having a second center frequency,

as specified in claim 10, and therefore contained in all claims dependent on claim 10.

First, as to claims 10 and 11, Hilbert transforms are not Fourier Transforms. The Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins read on the first and second Fourier transformers specified in claim 10. More specifically, the Office Action, on page 7, asserts that DesJardins “teaches these features, the first, second, Fourier transforms 18, 34.” This assertion is respectfully traversed. Reference numerals 18 and 34 in DesJardins denote Hilbert transforms. Hilbert transforms are not Fourier transforms. DesJardins discloses that the Hilbert transformation transforms the real sampled signal into a complex baseband signal sampled at one half the real sample rate (see column 1, lines 50-54). This is not a Fourier transform.

Second, as to claims 10 and 11, even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier transformers, Hilbert transforms 18 and 34 are not part of the processor specified in claim 10. The Office Action still fails to establish a *prima facie* case for the obviousness of claims 10 and 11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest both (1) a receiver that

includes a processor where the processor includes “circuitry to detect a frequency difference from the information signal” as specified in claim 9, and (2) the receiver where the circuitry to detect further includes first and second Fourier transformers as specified in claim 10, dependent on claim 9.

The Office Action, on page 4 and with respect to claim 9, asserts that “the processor coupled to the filter [sic.] bank 7, 8 in col. 2, lines 55-60 [sic.]” of Johnson reads on the claimed “processor coupled to the rf bridge to receive an information signal from rf bridge.” The Office Action reads the claimed information signal from the RF bridge as a signal output from a filter of the filter bank described in Johnson (column 2, lines 55-60).

The Office Action, on page 4, also asserts that the “circuitry to detect a frequency difference” is “the circuitry in [Johnson’s] Fig. 2 for detecting the frequency difference of the two transducer received signal having value of  $\Delta f \times (t/T)$  in col. 2, lines 7-16.” Although the Office Action is asserting Johnson’s disclosure with respect to FIG. 1, the Office Action regards the circuitry to detect as being at the output of Johnson’s mixer 3 and/or the output of Johnson’s filter bank (Johnson, column 2, lines 55-60). The Office Action reads the “circuitry to detect” on the part of Johnson’s signal processor described at column 2, line 56 that receives the claimed information signal from the Johnson filter bank and determines which filter in Johnson’s filter bank has received the echoed energy, the energized filter being an indication of the frequency difference.

The Office Action’s interpretation of claim 9 is inconsistent with DesJardins in a combination with Johnson. DesJardins, column 1, lines 43-46, discloses that receiver 9 at site 10 and receiver 11 at site 12 are spaced apart, and that it is the output of the spaced apart receivers 9 and 11 that are fed to Hilbert transforms 18 and 34. Even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier transformers, Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the “circuitry to detect” includes “a first Fourier transformer having a first center frequency” and “a second Fourier transformer having a second center frequency” as specified in claim 10 and therefore contained in all claims dependent on claim 10, particularly because Hilbert transforms 18 and 34 are spaced apart. Johnson, at column

2, line 56, discloses a signal processor that the Office Action asserts to be for processing the information signal. Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest that the circuit of Johnson's FIG. 2, asserted by the Office Action to be the RF bridge providing the information signal, provides the claimed information signal to the claimed "circuitry to detect." Thus, the claimed circuitry to detect does not include Hilbert transforms 18 and 34.

Alternatively, if the Office Action is asserting that the determining of a frequency difference is performed in cross-correlation function 110 of DesJardins' FIG. 2, then at the point in the processing chain where Hilbert transformers 18, 34 are located, there exists no information signal from which a frequency difference can be detected by the claimed "circuitry to detect" of the claimed "processor" of the receiver specified by claim 9. Hilbert transformer 18 that is part of site 10 and Hilbert transformer 34 that is part of site 12 are at spaced apart positions ahead of combining any signals from sites 10 and 12 (DesJardins FIG. 2).

The first and second Fourier transformers specified in claim 10 are specified as being included in the "circuitry to detect" of the processor of the receiver specified in claim 9. Accordingly, withdrawal of the rejection of claims 10 and 11 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited.

Third, as to claims 10 and 11, Hilbert transforms 18 and 34 of DesJardins do not have different center frequencies. Even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier transformers, the Office Action still fails to establish a *prima facie* case for the obviousness of claims 10 and 11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the "circuitry to detect" includes "a first Fourier transformer having a first center frequency" and "a second Fourier transformer having a second center frequency, the first center frequency being different than the second

center frequency” (emphasis added) as specified in claim 10 and therefore contained in all claims dependent on claim 10.

The Office Action, on page 7, asserts “DesJardins [sic.] teaches these features, the first, second, Fourier transforms 18, 34, for respective first [sic.], second, center frequency associated with the different center frequencies [sic.] of each FIR [sic.] filters [sic.] 20, 36, for determining of the transmitter location from two antenna signals (abstract, Fig. 1-3, col. 3, lines 35-59, col. 2, line 62 to col. 3, line 25, col. 5, lines 37-45). DesJardins teaches the measuring, calculating, of the range, and the difference in range  $\Delta R$  [sic.], the frequency difference of arrival (col. 2, lines 3-45), with accuracy to minimize error (col. 3, lines 17-31) for locating a transmitter.” To the extent that the Office Action is asserting that DesJardins teaches that Hilbert transforms 18, 34 have different center frequencies, this assertion is respectfully traversed.

DesJardins discloses that Hilbert transformer 18 at site 10 “moves one of the complex spectra to baseband and filters out the other,” column 1, lines 60-61. Then, DesJardins discloses that “site 12 performs identical ... Hilbert transformation 34” (emphasis added), column 2, lines 28-30. It is a logical impossibility for Hilbert transforms 18 and 34 to have identical transformations and at the same time have different center frequencies under these circumstances. Both Hilbert transformers 18 and 34 move one of the complex spectra to baseband (of the signal from the same transmitter 13, see DesJardins’ FIG. 2). Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest that first and second center frequencies are different as specified in claim 10 and therefore contained in all claims dependent thereon.

Accordingly, withdrawal of the rejection of claim 10 and all claims dependent on claim 10 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited.

4. Claim 11 is Unobvious Over Johnson In View Of Kitayama And DesJardins For Additional Reasons

Claim 11 is dependent on claim 10, and therefore, for all the reasons why claim 10 is unobvious over the applied art, so to, claim 11 is unobvious over the applied art.



In addition, the Office Action fails to establish a *prima facie* case of obviousness of claim 11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the “circuitry to detect” includes:

- a first Fourier transformer having a first center frequency; and
- a second Fourier transformer having a second center frequency;
- a digital frequency generator that generates:
  - a first digital signal at the first center frequency coupled to the first Fourier transformer; and
  - a second digital signal at the second center frequency coupled to the second Fourier transformer,

as specified in claim 11.

The Office Action asserts that A/D converters 16, 32 of DesJardins constitute the digital frequency generator. This assertion is respectfully traversed.

First, the claimed digital frequency generator is part of the claimed “circuitry to detect.” In contrast, DesJardins, column 1, lines 43-46, discloses that receiver 9 at site 10 and receiver 11 at site 12 are spaced apart, and that it is the output of the spaced apart receivers 9 and 11 that are fed to Hilbert transforms 18 and 34. Even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier transformers, Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the “circuitry to detect” includes “a digital frequency generator that generates” both:

- a first digital signal at the first center frequency coupled to the first Fourier transformer; and
- a second digital signal at the second center frequency coupled to the second Fourier transformer,

as specified in claim 11. The Office Action asserts that A/D converters 16, 32 of DesJardins read on the digital frequency generator. However, at least because A/D converters 16, 32 are at

spaced apart locations in DesJardins sites 10 and 12, A/D converters 16, 32 cannot both be part of the digital frequency generator specified in claim 11. Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest that the claimed "circuitry to detect" includes a digital frequency generator that in turn includes A/D converters 16, 32.

Second, Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a digital frequency generator of the type that generates first and second digital signals at the first and second center frequencies (of the respective first and second Fourier transformers), respectively, where the first center frequency is different than the second center frequency. More specifically, the values of digital signals at the outputs of both A/D converters 16, 32 of DesJardins carry a frequency defined by the signal from transmitter 13 or any down converted version thereof created in receivers 9 and 11 of DesJardins. These digital values output from A/D converters 16, 32 represent the same frequency and not a first center frequency different than a second center frequency as specified in claim 10 and therefore contained in claim 11.

Accordingly, withdrawal of the rejection of claim 11 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations are disclosed, taught or suggested by the applied references.

5. Each Of Claims 17, 20 and 22-23 Is Unobvious Over Johnson In View Of Kitayama And DesJardins For At Least The Reasons Discussed Above

Claim 17 is an independent method claim and claims 20 and 23 are dependent on claim 17. Claim 22 is an independent method claim.

With respect to claims 17, 20 and 22-23, and although the Office Action rejects method claims 17, 20 and 22-23 under 35 U.S.C. §103(a) "as being unpatentable over Johnson '220 (sic.) in view of Kitayama, as applied to [receiver] claim 9 above, and further in view of DesJardins (sic.) (US 5,570,099)," (i.e., although method claims are rejected on the basis of a receiver claim), this rejection is interpreted as if it asserted that the meanings of claim terms in receiver

claim 9, that are interpreted to have meanings for parts allegedly disclosed in Johnson '220 in view of Kitayama, are to be applied to similar claim terms used in method claims 17, 20 and 22-23. The rejection of method claims 17, 20 and 22-23 is respectfully traversed.

First, as to claims 17, 20 and 22-23 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Second, as to claims 17, 20 and 22-23 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Kitayama is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

6. Each Of Claims 17, 20 and 23 Is Unobvious Over Johnson In View Of Kitayama And DesJardins For Additional Reasons

First, as to claims 17, 20 and 23 and as discussed above with respect to claim 10, Hilbert transforms are not Fourier transformers. The Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins read on the first and second Fourier transformers specified in claim 17. More specifically, the Office Action, on page 8, asserts that DesJardins discloses "forming a first Fourier transform (Hilbert transform 18) of the information signal at a first center frequency (center frequency used by FIR filter 20), forming a second Fourier transform (Hilbert transform 34) of the information signal at a second center frequency (center frequency used by FIR filter 36)." Contrary to the Office Action's erroneous assertions, Hilbert transforms are not Fourier transforms. DesJardins discloses that the Hilbert transformation transforms the real sampled signal into a complex baseband signal sampled at one half the real sample rate (see column 1, lines 50-54). This is not a Fourier transform.

Second, as to claims 17, 20 and 23 and as discussed above with respect to claim 10, even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed

Fourier transformers in the manner proposed in the Office Action, even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention, and even if, *arguendo*, Kitayama were to be regarded as analogous art to the claimed invention, the Office Action still fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a method that includes:

capturing a frequency difference ... ;

producing an information signal onto which the frequency difference has been modulated;

forming a first Fourier transform of the information signal at a first center frequency; and

forming a second Fourier transform of the information signal at a second center frequency, the second center frequency being different than the first center frequency,

as specified in claim 17, and therefore contained in claims 20 and 23 dependent on claim 17.

The modification of Johnson in view of Kitayama and DesJardins proposed by the Office Action does not form first and second Fourier transforms of the same information signal as specified in claim 17, and therefore contained in claims 20 and 23 dependent on claim 17. Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a method that includes "producing an information signal onto which the frequency difference has been modulated," where it is the same information signal that is used to form the first and second Fourier transforms as specified in claims 17, 20 and 23. DesJardins, column 1, lines 43-46, discloses that receiver 9 at site 10 and receiver 11 at site 12 are spaced apart, and that it is the output of the spaced apart receivers 9 and 11 that are fed to Hilbert transforms 18 and 34. The outputs of two spaced apart receivers 9 and 11 cannot be regarded as the claimed information signal. Accordingly, withdrawal of the rejection of claims 17, 20 and 23 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited.

Third, as to claims 17, 20 and 23 and as discussed above with respect to claim 10, even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier

transformers in the manner proposed in the Office Action, even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention, and even if, *arguendo*, Kitayama were to be regarded as analogous art to the claimed invention, the Office Action still fails to establish a *prima facie* case of obviousness of claims 17, 20 and 23 at least because Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a method that includes “producing an information signal onto which the frequency difference has been modulated,” where “a first Fourier transform of the information signal [is formed] at a first center frequency” and “a second Fourier transform of the information signal [is formed] at a second center frequency” such that “the second center frequency [is] different than the first center frequency” (emphasis added) as specified in claim 17, and therefore contained in claims 20 and 23 dependent on claim 17.

The Office Action, on page 8, asserts “the second center frequency being different than the first center frequency (the center frequency of FIR filter (sic.) 20 is for frequency of receiver 10 which is different from the center frequency of FIR filter 36 which is for frequency of receiver 12).” Contrary to the Office Action’s erroneous assertions, DesJardins discloses that Hilbert transformer 18 at site 10 “moves one of the complex spectra to baseband and filters out the other,” column 1, lines 60-61. Then, DesJardins discloses that “site 12 performs identical ... Hilbert transformation 34” (emphasis added), column 2, lines 28-30. It is a logical impossibility for Hilbert transforms 18 and 34 to have identical transformations and at the same time have different center frequencies under these circumstances. Both Hilbert transformers 18 and 34 move one of the complex spectra to baseband (of the signal from the same transmitter 13, see DesJardins’ FIG. 2). Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest that first and second center frequencies are different as specified in claims 17, 20 and 23. Accordingly, withdrawal of the rejection of claims 17, 20 and 23 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and DesJardins is earnestly solicited.

7. Claim 22 Is Unobvious Over Johnson In View Of Kitayama And DesJardins

As to independent method claim 22, Johnson In View Of Kitayama And DesJardins does not disclose, teach or suggest a method that includes:

capturing a frequency difference that is present at first and second antennas;

producing an information signal onto which the frequency difference has been modulated;

analyzing the information signal to determine the frequency difference; and

determining a range from the information signal based on the frequency difference

as specified in claim 22.

The Office Action, at page 8, asserts that “DesJardins teaches the determining a range based on a frequency difference.”

Even if, *arguendo*, DesJardins teaches determining a range based on a frequency difference, Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a method where the frequency difference is determined based on the analysis of an information signal, and where in turn, the information signal is produced so that a frequency difference that is present at first and second antennas has been modulated onto the information signal as specified in claim 22.

Accordingly, withdrawal of the rejection of claim 22 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited.

**D. Claim 12 Is Unobvious Over Johnson in view Kitayama et al. And DesJardins And Further In View Of Maitre et al.**

The Office Action rejects claim 12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,245,220 to Johnson in view of U.S. Patent No. 5,107,522 to Kitayama, et al. (hereinafter Kitayama), and further in view of U.S. Patent No. 5,570,099 to DesJardins, as applied to claim 10, and further in view of U.S. Patent No. 4,903,030 to Maitre et al. (hereinafter Maitre). This rejection is respectfully traversed.

1. Claim 12 Is Not Unpatentable At Least Because Johnson And Kitayama Are Non-Analogous Art

First, as to claim 12 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Second, as to claim 12 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Kitayama is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

2. Claim 12 Is Unobvious Over Johnson In View Of Kitayama And DesJardins And Maitre et al. For At Least The Reasons Discussed With Respect To The Rejection Of Claim 10 Over Johnson In View Of Kitayama And DesJardins

First, as to claim 12 and as discussed above with respect to claims 1-2, 9, 14-15 and 21, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama does not disclose, teach or suggest a reason to modify the receiving arrangement of Johnson to include the AFC circuit of Kitayama as proposed by the Office Action with respect to the rejection of claim 9. Furthermore, the addition of DesJardins and Maitre to the applied art does not disclose, teach or suggest modifying the receiving arrangement of Johnson to include the AFC circuit of Kitazawa as proposed by the Office Action.

Second, as to claim 12 and as discussed above with respect to the rejection of claims 9 and 14-15, PLL 320 is not digital and cannot be regarded as the digital frequency source specified in claim 9. Furthermore, the addition of DesJardins and Maitre to the applied art does not disclose, teach or suggest that PLL 320 is the digital frequency source specified in claim 9.

Third, as to claim 12 and as discussed above with respect to claims 9 and 14-15, even if, *arguendo*, PLL 320 was to be regarded as the digital frequency source specified in claim 9, PLL 320 is not part of microprocessor 307, and for at least this reason, Johnson in view of Kitayama does not disclose, teach or suggest a “processor including a digital frequency source” as specified in claim 9. Furthermore, the addition of DesJardins and Maitre to the applied art does not disclose, teach or suggest that PLL 320 is part of microprocessor 307 and that Johnson in view of Kitayama disclose a “processor including a digital frequency source” as specified in claim 9.

Fourth, as to claim 12 and as discussed above with respect to the rejection of claims 9 and 14-15, even if, *arguendo*, microprocessor 307 was to be combined with PLL 320 and the combination was to be regarded as the processor specified in claim 9, Johnson in view of Kitayama still does not disclose, teach or suggest a receiver that includes a processor where the processor includes both:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9. Furthermore, the addition of DesJardins and Maitre to the applied art does not disclose, teach or suggest that the processor includes a digital frequency source to generate a signal and circuitry to detect a frequency difference where both the signal generated by the digital frequency source is based on the signal from the clock source and the circuitry to detect detects the frequency based on the signal from the clock source as specified in claim 9. Simply put, Johnson in view of Kitayama and DesJardins and Maitre does not disclose, teach or suggest that “the signal from the clock source,” which the Office Action asserts to be the output of reference oscillator 324, is coupled to any circuitry used to detect a “frequency difference from the information signal” as specified in claim 9.



Fifth, as to claim 12 and as discussed above with respect to the rejection of claims 9 and 14-15, even if, *arguendo*, microprocessor 307 was to be combined with PLL 320 and the combination was to be regarded as the processor specified in claim 9, Johnson in view of Kitayama still does not disclose, teach or suggest a receiver that includes a processor where the processor includes both

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9. Furthermore, the addition of DesJardins and Maitre to the applied art does not disclose, teach or suggest that the processor includes both the digital frequency source and the circuitry to detect as specified in claim 9. Simply put, the signal processor described by Johnson at column 2, line 56 has no disclosed relation to the Office Action's asserted processor assumed, in this instance, to include Kitayama's microprocessor 307 and PLL 320.

Sixth, as to claim 12 and as discussed above with respect to claim 10, Hilbert transforms are not Fourier Transforms. The Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins read on the first and second Fourier transformers specified in claim 10. More specifically, the Office Action, on page 7, asserts that DesJardins "teaches these features, the first, second, Fourier transforms 18, 34." This assertion is respectfully traversed. Reference numerals 18 and 34 in DesJardins denote Hilbert transforms. Hilbert transforms are not Fourier transforms. DesJardins discloses that the Hilbert transformation transforms the real sampled signal into a complex baseband signal sampled at one half the real sample rate (see column 1, lines 50-54). This is not a Fourier transform. Furthermore, the addition of Maitre to the applied art does not disclose, teach or suggest that Hilbert transforms are Fourier transforms as specified in claim 10.

Seventh, as to claim 12 and as discussed above with respect to claim 10, even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier transformers, Hilbert transforms 18 and 34 are not part of the processor specified in claim 10. The Office Action still fails to establish a *prima facie* case for the obviousness of claims 10 and 11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest both (1) a receiver that includes a processor where the processor includes “circuitry to detect a frequency difference from the information signal” as specified in claim 9, and (2) the receiver where the circuitry to detect further includes first and second Fourier transformers as specified in claim 10, dependent on claim 9. Furthermore, the addition of Maitre to the applied art does not disclose, teach or suggest that Hilbert transforms are Fourier transforms as specified in claim 10. Simply put, the Office Action’s interpretation of claim 9 is inconsistent with DesJardins in a combination with Johnson at least because DesJardins, column 1, lines 43-46, discloses that receiver 9 at site 10 and receiver 11 at site 12 are spaced apart. Alternatively, even if, *arguendo*, the Office Action were to assert that the determining of a frequency difference is performed in cross-correlation function 110 of DesJardins’ FIG. 2, then at the point in the processing chain where Hilbert transformers 18, 34 are located, there exists no information signal from which a frequency difference can be detected by the claimed “circuitry to detect” of the claimed “processor” of the receiver specified by claim 9.

Eighth, as to claim 12 and as discussed above with respect to claim 10, Hilbert transforms 18 and 34 of DesJardins do not have different center frequencies. Even if, *arguendo*, Hilbert transforms 18 and 34 were to be regarded as readable on the claimed Fourier transformers, Johnson in view of Kitayama and DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the “circuitry to detect” includes “a first Fourier transformer having a first center frequency” and “a second Fourier transformer having a second center frequency, the first center frequency being different than the second center frequency” (emphasis added) as specified in claim 10 and therefore contained in all claims dependent on claim 10. Furthermore, the addition of Maitre to the applied art does not disclose, teach or suggest that the first center frequency is different than the second center frequency.

DesJardins discloses that Hilbert transformer 18 at site 10 “moves one of the complex spectra to baseband and filters out the other,” column 1, lines 60-61. Then, DesJardins discloses that “site 12 performs identical ... Hilbert transformation 34” (emphasis added), column 2, lines 28-30. It is a logical impossibility for Hilbert transforms 18 and 34 to have identical transformations and at the same time have different center frequencies under these circumstances.

3. Claim 12 Is Unobvious Over Johnson In View Of Kitayama And DesJardins And Maitre For Additional Reasons

In addition and as to claim 12, the Office Action fails to establish a *prima facie* case of obviousness of claims 12 at least because Johnson in view of Kitayama and DesJardins and further in view of Maitre does not disclose, teach or suggest that “the circuitry to detect further includes a frequency discriminator coupled to the first and second Fourier transformers” as specified in claim 12.

First, the Office Action asserts that modifying Johnson in view of Kitayama and DesJardins to include Maitre’s discriminator 27, that is coupled to frequency analysis 26 of Maitre, will render claim 12 obvious. This assertion is respectfully traversed. As discussed above with respect to claim 10, Hilbert transformers 18 and 34 (of DesJardins) are located before signals are combined from sites 10 and 12, not after signals from sites 10 and 12 are combined. Furthermore, both Hilbert transformers are used to shift the complex spectra to baseband. As a result, the use of a frequency discriminator coupled to such Hilbert transformers would not achieve the structure specified in claim 12.

Second, the applied art provides no motivation to couple Maitre’s frequency discriminator 27 to the claimed first and second Fourier transformers (even if they were regarded to be Hilbert transformers) in the specific way specified in claim 12. The Office Action asserts that the motivation is “such that the angle of signal arrival could be accurately measured” (page 9, lines 6 and 7). This assertion is respectfully traversed. The first and second Fourier transformers specified by claim 10 are such that the frequency discriminator of claim 12 measures range, not angle of arrival.

Accordingly, withdrawal of the rejection of claim 12 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins as applied to claim 10, and further in view of Maitre et al. is earnestly solicited.

**E. Claim 13 Is In Proper Form For Allowance**

The Office Action objects claim 13 as being dependent upon a rejected base claim. Claim 13 is dependent on claim 10. The implied assertion that claim 10 is properly rejected is respectfully traversed for at least the reasons discussed above with respect to the rejection of claim 10. Upon reconsideration of claim 10 and a finding of the patentability of claim 10, claim 13 is in condition for allowance. Withdrawal of the objection to claim 13 is earnestly solicited.

**CONCLUSION**

By traversing all of the above rejections based on the specific remarks discussed above, I do not intend to imply that other grounds do not exist for traversing any or all rejections or objections.

In view of the present amendments and remarks, withdrawal of the rejections of the claims is earnestly solicited. It is respectfully submitted that the present application is in condition for allowance. Prompt reconsideration and allowance of the application are earnestly solicited. Should the examiner believe that any further action is necessary to place the application in condition for allowance, the examiner is invited to contact the undersigned applicant at the telephone number listed below. Furthermore, please note the change of address and telephone number.

Respectfully submitted,

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